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AUTHOR Karp, Hilary Jo
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ABSTRACT

The extent of use of the Personalized System of Instruction (PSI), also called the Keller Plan, at a large university campus was investigated. Attention was also directed to the features of PSI used: mastery criterion, self-pacing, proctors, number of times students could retake an exam, and the number of forms of each examination used. The PSI includes clearly delineated objectives or study guides, formulated by the instructor, and presented to the students as a series of units arranged in hierarchical order. From this material students learn, usually without lectures. Of 115 full-time faculty members who were sent a questionnaire, 85 responded. Eighty-one percent of the respondents used the lecture method, and usage ranged from 100 percent by the natural sciences and engineering department to a low of 68 percent in the humanities department. The seminar/discussion method was used by 27 percent of the respondents. The humanities faculty used this method the most (50 percent), and the engineering faculty the least (0 percent). Many faculty used lectures for lower-level classes, and seminar/discussion for upper-level classes. PSI, the least used method, was used by faculty in the behavioral sciences (33 percent) and business (10 percent). Only 18 percent of the respondents had ever used the PSI. The PSI features most often used were self-pacing, a mastery criterion, and the use of several versions of the exam over each unit. The questionnaire is included. (SW)

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THE USE OF KELLER'S PERSONALIZED SYSTEM OF INSTRUCTION

Hilary Jo Karp

University of Houston at Clear Lake City

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HE 016 349

The Use of Keller's Personalized System of Instruction

Hilary Jo Karp
University of Houston at Clear Lake City

Education does not seem to have changed radically since Comenius set out principles for lectures and group instruction in The Great Didactic in 1638. The use of lectures with added demonstrations, discussions, laboratory exercises, and questions from the instructor has a long history. This history was recently interrupted by the development of a new teaching methodology by Keller in the early 1960s, a methodology based on the principles of learning already established in the laboratory. The principles established by Keller came to be known as the Personalized System of Instruction (PSI) or the Keller Plan (Keller, 1982).

PSI necessitates that the instructor determine what material is to be learned and specify that material clearly, usually in the form of objectives or study guides which indicate the questions that a successful student will be able to answer. This material should then be broken down into small units and these units arranged in a hierarchical order. The material is presented in a written form so that students can go over it as often as is necessary to learn it. Lectures, if used at all, are only used for motivational and inspirational purposes, not for the transmission of vital information.

Students are examined over each unit of material in order, and must reach a high criterion of mastery in each unit before going on to the next unit. However, the student can with no penalty go over each unit and be re-examined on each unit as many times as is necessary to reach that criterion . The rapidity with which the student moves through the units is determined by the student and the student's abilities. The instructor evaluates the student's mastery of the material, not the speed of that mastery. Thus the rapidity of learning is determined by the student (self-paced). In order for the examinations to determine that the student has indeed mastered the material, rather than memorized the correct answers, several forms of each unit examination are typically used.

In order to make such a system work, typically student proctors are used. These are students who have already mastered the material and who agree to administer the many examinations necessitated by the PSI method, and to give individualized help to the students as they need it. Students who themselves have recently mastered the material are often able to explain the material at a level readily accessible to students who are having problems. In addition, the instructor is readily available to the students for explanations and help (Keller, 1968; Keller and Sherman, 1982). Keller (1981) has emphasized that success in using the PSI method depends on using all of the features of PSI, rather than approximations.

A great deal of research has been done comparing the PSI method or Keller Plan with the more conventional lecture method. A meta-analysis, or review, of that research indicates that students are in general learning more, and expressing more satis-

faction with classes using the PSI method, without changes in the numbers withdrawing from the courses or changes in the amount of time students put in for study (Kulik, Kulik, and Cohen, 1979).

Since the value of this new methodology has been so well established, it would be reasonable to expect that many instructors, if not most, would be using this new method. The purpose of this preliminary study was to determine the extent of use of the PSI method at one campus of a large University system, and develop the questions appropriate to ask for further studies. A second purpose of this study was to determine the extent to which those who used the PSI method used various features of it.

Method

Subjects: The subjects were the full-time faculty of one campus of a large university system, who filled out the survey form which they received in the university mail.

Apparatus: A one page questionairre was used. Questions were asked about the teaching method primarily used, whether the respondent had ever used a PSI method, and for those who answered yes, questions were asked about the features of PSI used (mastery criterion, self-pacing, proctors, number of times students could re-take an exam, and number of forms of each examination used) (Figure 1).

Procedure: The questionairre was sent out to all full-time members of the faculty listed in the 1982 directory. After four weeks, a second copy of the questionairre was sent out to those who had not yet responded.

Results

Of the 115 members of the full-time faculty who were sent the questionairre, 85 returned it, for a 74% return rate. The number of respondents from each department of the University is shown in the top line of Table 1, with the percentage that represents of all respondents.

The questionairre asked respondents to indicate which method of teaching they primarily used. The number of respondents in each department who checked each method, along with the percentage of respondents from that department that this represents is indicated in Table 1. Many respondents indicated that they used more than one method.

Clearly, the most commonly used method is the lecture method with 81% of the respondents indicating its use. The percentage of usage, however, varies with the department, ranging from a low of 68% in the Humanities to a high of 100% in the Natural Sciences and Engineering.

The seminar/discussion method was used by 27% of the respondents. The Humanities faculty used this method the most (50%), and the Engineering faculty the least (0%). Many faculty indicated that they used lectures for lower level classes, and seminar/discussion for upper level classes.

Personalized Systems of Instruction (PSI) was the least used

Figure 1:

SURVEY ON INSTRUCTIONAL TECHNIQUES

The purpose of this survey is to provide us with information about the teaching techniques used by U of H faculty. All individuals providing information will remain anonymous, and the results will be available to all respondents who so request. Thank you.

Hilary Karp, Ph.D.
Associate Professor of Psychology, UHCLC

John H. Hummel, Ph.D.
Associate Professor of Psychology, UHDC

NAME: _____ (for follow-up information only)

U of H CAMPUS WHERE YOU TEACH: __UHCC __UHCLC __UHDC __UHV

HIGHEST DEGREE HELD: __ MASTERS __DOCTORATE

DEPARTMENT OR PROGRAM IN WHICH YOU TEACH: _____

DISCIPLINE THAT YOU TEACH: _____

WHICH OF THE FOLLOWING IS THE FOLLOWING IS THE PRIMARY METHOD OF INSTRUCTION THAT YOU USE?

__ 1. Lecture
__ 2. Individualized Student Instruction/Personalized Student Instruction/Keller Plan
__ 3. Seminar/discussion
__ 4. Other (please describe): _____

_____

HAVE YOU EVER USED THE KELLER PLAN OR A METHOD SIMILAR TO IT? __ yes __no

IF YOU HAVE USED THE KELLER PLAN, ANSWER THE FOLLOWING:

DO YOU CURRENTLY USE THE TECHNIQUE IN AT LEAST ONE OF YOUR COURSES? __ yes __ no

HOW MANY EXAMS PER UNIT OF MATERIAL DID/DO YOU USE? _____

DID/DO YOU USE A MASTERY CRITERION? __ yes __ no

IF YES, WHAT WAS THE MASTERY LEVEL REQUIRED BEFORE A STUDENT COULD PROGRESS TO THE NEXT UNIT OF MATERIAL? _____%

DID/DO YOU USE SELF-PACING? __yes __ no

IF NO, WHAT VARIATION DID YOU USE? _____

_____

HOW MANY TIMES CAN/COULD A STUDENT TEST OVER A PARTICULAR UNIT OF MATERIAL? _____

DID/DO YOU USE PROCTORS? __ yes __ no

Please return completed surveys to: John H. Hummel, Dept. of Behavioral Science (Rm. 713-S), UHDC, One Main St., Houston, TX 77002

of the specified methods with only 16% of the faculty using it. This is probably an overestimate of the use of PSI. The category on the questionairre was labled Individualized Student Instruction/Personalized Student Instruction/ Keller Plan. Nine members of the Humanities faculty checked this category, but in the question where they were asked if they had ever used the Keller Plan or a method similar to it, they indicated no, and some even wrote in that they did not know what the Keller Plan was. Since other members of the Humanities faculty wrote in Individualized Instruction under the category, "other", it seems likely that the nine faculty who had indicated this category were referring to individualized instruction that was not similar to the Keller Plan, except possibly accidentally. If we do not consider the nine Humanities faculty as using the Keller Plan, only faculty in Behavioral Sciences (33%) and in Business (10%) currently use PSI.

The "other" methods used were combinations, case-study methods, laboratory methods, individualized programs, etc.. "Other" methods were most often used by the Natural Sciences faculty (33%), Engineering (25%) faculty, the Humanities faculty (18%, plus the 41% who indicated individualized methods), and the Business (16%) faculty.

The last line of Table 1 indicates the number and percentage of faculty in each department who had ever used the Keller Plan or a method similar to it. Of the 85 respondents, 15, or 18% had ever used the Keller Plan. The Behavioral Sciences faculty had the largest group who had ever used PSI (56%), followed by the Natural Sciences faculty (33%) and the Social Sciences faculty (27%).

Of the 15 faculty members who indicated that they had used the Keller Plan, only four (27%) were currently using it. Ten had indicated that they did not currently use it, and one did not answer that question.

Table 2 shows the percentage of the faculty who had used the Keller Plan, who had used each of the five features surveyed. The features of the Keller Plan that were asked about were the use of a mastery criterion, use of self-pacing, use of proctors, the number of times a student could take a test over each unit. and the number of exams used per unit of material. The features used most often were self-pacing (by 87% of the respondents), a mastery criterion (used by 73%), and the use of several versions of the exam over each unit (used by 60%). While a very high percentage of the respondents indicated that they used self-pacing, two of these respondents specifically noted that the self-pacing was done within the constraints of a semester. Since such constraints are commonly used by faculty members, and since that was not asked about, it is very likely that many others of those who used self-pacing used it with the constraint that the work must be completed within the semester.

At the bottom of Table 2, the number of the specified features of the Keller Plan, from zero to five, used by those faculty who indicated that they had used the Keller Plan is shown. Only 20% of that faculty used all of the five features. An additional 13% used four of the five. The greatest percentage of that faculty (40%) used three of the five features. Thus, 73%

used three or more of the five features. It is interesting to note that two of the faculty who reported that they had used the Keller Plan used none of the features surveyed.

Table 3 shows a more detailed analysis of some of the features used. The first line examines the number of exams per unit of material used. Those who used more than one exam for each unit, used varying numbers of exams, and two faculty members indicated that within the course the number of exams for each unit varied, depending on the unit.

The second line of Table 3 examines the mastery criterion used. The mastery criteria ranged from 60% to 95%, with the largest group using a mastery criterion in the 90s. Thus, a large percentage of those using a mastery criterion were using a very high level of mastery as the criterion level.

The third line of Table 3 indicates the number of times a student could take an exam over each unit. While only five (33%) allowed for infinite retakes, almost all allowed for some retakes.

Conclusions

As we can see, the lecture method continues to be the most frequently used method of teaching at this University. Only a small percentage of the faculty are using the Keller Plan, despite the wealth of research suggesting its superiority to the lecture method.

This may be due to a lack of familiarity with the Keller Plan. Only 18% of the respondents had ever used the Keller Plan, and many faculty commented that they did not know what the Keller Plan was. It might be very worthwhile to present information about the Keller Plan, especially for the Humanities faculty, since many use individualized forms of instruction, but are unfamiliar with the Keller Plan.

However, the small percentage of those who have ever used the Keller Plan who are currently using it, suggests that the issue of unfamiliarity is not the only one to address. A further survey of those who have used the plan which specifically addressed why it is not currently used would be helpful. It may be that practical constraints in the University make it difficult to use the Keller Plan, or there may be problems which those who have used the plan have run into. As Keller (1981) indicated that the success with using the plan decreases as the method used deviates from the Keller Plan, the problems might be due to the use of only some of the features of the Keller Plan, which many indicated that they had done.

In addition, further questions may be asked about other features of PSI, such as the size and number of units, the use of objectives or study guides, and the use of lectures for information or motivation.

It might be useful to refine the questionairre (by being more specific about the constraints of self-pacing, and by not including other "individualized instruction" in the same category as PSI or the Keller Plan), and to add questions about the other features, and to survey other campuses for use of PSI. The survey instrument itself may be a method of informing faculty

about the existence of these procedures, as well as a way of determining which disciplines might have interest in finding out more about PSI.

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Table 1: Number and Percent
of Respondents
Who Used Various Teaching Methods

	Humn.	Soc. Sci.	Beh. Sci.	Natl. Sci.	Math Sci.	Bsnss	Engnrng Tech.	Total
Respon-dents (N)	22 (.26)	11 (.13)	9 (.10)	9 (.10)	11 (.13)	19 (.22)	4 (.05)	85
Lec-ture	15 (.68)	10 (.91)	7 (.78)	9 (1.00)	8 (.73)	16 (.84)	4 (1.00)	69 (.81)
Sem./ Disc.	11 (.50)	3 (.27)	3 (.33)	1 (.11)	1 (.09)	4 (.21)	0 (0.0)	23 (.27)
Indiv. PSI	9* (.41)	0 (0.0)	3 (.33)	0 (0.0)	0 (0.0)	2 (.10)	0 (0.0)	14 (.16)
Other	4 (.18)	1 (.09)	0 (0.0)	3 (.33)	1 (.09)	3 (.16)	1 (.25)	13 (.15)
Have Ever Used PSI	1 (.04)	3 (.27)	5 (.56)	3 (.33)	1 (.09)	2 (.10)	0 (0.0)	15 (.18)

Table 2: Use of Features of Keller Plan

	Yes	No	No Answer
Used Mastery Criterion	11 (.73)	3 (.20)	1 (.07)
Used Self-Pacing	13 (.87)	1 (.07)	1 (.07)
Used Proctors	6 (.40)	8 (.53)	1 (.07)
Used Several Exams/Unit	9 (.60)	4 (.27)	2 (.13)
Allowed Infinite Retakes	5 (.33)	8 (.53)	2 (.13)

Number of Features Used	0	1	2	3	4	5
Number of Respondents	2	0	2	6	2	3
Percent of Respondents	13	0	13	40	13	20

Table 3: Specific Features of Keller Plan Used

Number of Exams Per Unit	1	2	3	>3	varies
Respondents	4	3	3	1	2

Mastery Criterion (%)	60s	70s	80s	90s
Respondents	2	2	2	5

Retakes/Unit Allowed	1	2	3	5	infinity
Respondents	1	2	4	1	5